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Meta-Analysis Reveals no Significant Association of EPHX1 Tyr113His and His139Arg Polymorphisms with the Colorectal Cancer Risk

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Abstract

The Tyr113His and His139Arg polymorphisms in microsomal epoxide gene (EPHX1) have been reported to be associated with colorectal cancer (CRC) risk, but the results are inconclusive. Considering the functional importance of these polymorphisms and heterogeneity in genetic association studies, we performed a meta-analysis to investigate the association between the EPHX1 Tyr113His and His139Arg polymorphisms and CRC susceptibility. A comprehensive literature search of

PubMed, Embase, and Google Scholar databases were conducted before May 10, 2019. Twenty eligible studies were finally included in this meta-analysis. The pooled odds ratio (OR) with 95% confidence intervals (CIs) were calculated. In the overall analysis, both Tyr113His and His139Arg polymorphisms were not associated with CRC in allelic and dominant genetic models. On subgroup analysis, no significant associations were observed in Asians and Caucasians in any of the genetic models for these polymorphisms. Our results were confirmed by sensitivity analysis and no publication bias was found. Taken together, our data indicate that EPHX1 Tyr113His and His139Arg polymorphisms are not associated with the susceptibility to colorectal cancer. Further well-designed studies with large sample size are warranted to establish the role of EPHX1 polymorphisms in CRC, especially for Tyr113His and His139Arg.

Keywords

Colorectal cancer   **Meta-analysis**

Microsomal epoxide hydrolase   **EPHX1**

Polymorphism   **Susceptibility**

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Abbreviations

Arg: Arginine

CI: Confidence intervals

CRC: Colorectal cancer

FEM: Fixed effects model

HCAs: heterocyclic amines

His: Histidin

HPFS: Health Professionals Follow-up Study

HWE: Hardy-Weinberg equilibrium

mEH: microsomal epoxide gene

NHS: Nurses' Health Study

OR: Odds ratio

PAHs: polycyclic aromatic hydrocarbons

PC: Pancreatic cancer

PLCO trial: Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial

REM: Random effects model

SNPs: Single nucleotide polymorphisms

Tyr: Tyrosine

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Conflict of Interest

There are no conflicts of interests.

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